2020 Peninsula Gateway Corridor Study

Draft Memorandum
Task 8 - Conceptual Cost Estimates

Prepared for:

City/County Association of Governments
Of San Mateo County

San Mateo County Transportation Authority

Santa Clara Valley Transportation Authority

Prepared by:

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and Associates, Inc.

February 27, 2006

This memorandum summarizes the procedures and findings of *Task 8 – Conceptual Cost Estimates* of the 2020 Peninsula Gateway Corridor Study, which is being conducted by Kimley-Horn and Associates (KHA) for the City/County Association of Governments of San Mateo County (C/CAG), the San Mateo County Transportation Authority, and the Santa Clara Valley Transportation Authority. This document is organized as follows:

I. INTRODUCTION

The focus of the 2020 Peninsula Gateway Corridor Study is to identify and evaluate potential traffic projects to improve the connection from the Dumbarton Bridge to Route 101, and to improve traffic flow along the Route 101 corridor between Mountain View and Redwood City. From an initial "universe" of some 320 potential project opportunities, 8 projects were selected for further analysis in this phase of the study. A concept level engineering evaluation and alternatives analysis of these 8 project opportunities resulted in 13 alternative projects for which cost estimates were completed, as follows:

1) Alt. 1.1 - Rte. 101 Auxiliary lanes – Embarcadero to Shoreline
2) Alt. 2.1 - Rte. 101 Elevated Express Lanes (Mix Traffic)
3) Alt. 2.2 - Rte. 101 Elevated Express Lanes (HOV Lanes)
4) Alt. 3.1 - Bayfront Exp. Grade Separations
5) Alt. 4.1 - Willow Rd. Short Term Improvements
6) Alt. 6.1 - Willow Rd. Elevated Express Lanes
7) Alt. 7.1 - Willow Rd. Depressed Express Lanes
8) Alt. 7.2 - Willow Rd. Depressed Express Lanes w/ Cantilever Frontage
9) Alt. 7.3 - Willow Rd. Tunnel
10) Alt. 8.1 - University Ave. Short Term Improvements
11) Alt. 9.1 - University Ave. Depressed Express Lanes
12) Alt. 9.2 - University Ave. Depressed Express Lanes w/ Cantilever Frontage
13) Alt. 9.3 - University Ave. Tunnel

This memorandum presents the concept level cost estimates that were developed for the 13 alternative projects. The memorandum also summarizes the assumptions that were made when preparing the cost estimates.

The information presented herein was developed primarily by Mark Thomas and Company (Alternatives 1, 2, 3 and 9) and Caltrans District 4 (Willow Road alternatives except short term), sub-consultants to KHA.

II. COST ESTIMATE SUMMARY

The following table summarizes the cost estimates for each of the 13 alternative projects in Year 2006 dollars. The cost estimate is broken down into three primary categories: (1) construction cost, (2) right of way cost, and (3) engineering support cost. The total project cost is provided in both Year 2006 and Year 2025 dollars, the latter to coincide with the traffic forecast horizon and to stress the time value of money. The Year 2025 total is based on an assumed escalation rate of 3.5% per year, which it the standard rate used by Caltrans for projecting costs at this early stage of development.

Cost Estimate Summary Table

Alternative Name	Construction Cost	R/W Cost	Support Cost	Total Project Cost 2006 $	Total Project Cost 2025 $
1.1 – Route 101 Auxiliary Lanes	$57 M	$20 M	$28 M	$105 M	$202 M
2.1 – Route 101 Elevated Mixed	$900 M	$80 M	$230 M	$1,210 M	$2,330 M
2.2 – Route 101 Elevated HOV	$850 M	$70 M	$220 M	$1,140 M	$2,190 M
3.1 – Bayfront Exp. Grade Separations	$180 M	$67 M	$86 M	$333 M	$640 M
4.1 – Willow Rd. Short Term	$0.09 M	$0 M	$0.03 M	$0.12 M	$0.24 M
6.1 – Willow Rd. Elevated Express Lanes	$96 M	$33 M	$46 M	$175 M	$336 M
7.1 – Willow Rd. Depressed Express Lanes	$170 M	$40 M	$82 M	$292 M	$561 M
7.2 – Willow Rd. Depressed w/ Cantilever	$230 M	$33 M	$110 M	$373 M	$717 M
7.3 – Willow Rd. Tunnel	$280 M	$33 M	$130 M	$443 M	$852 M
8.1 – University Ave. Short Term	$0.18 M	$ 0 M	$0.09 M	$0.27 M	$0.52 M
9.1 – University Ave. Depressed Express Lanes	$310 M	$72 M	$150 M	$532 M	$1,023 M
9.2 – University Ave. Depressed w/ Cantilever	$440 M	$64 M	$200 M	$704 M	$1,350 M
9.3 – University Ave. Tunnel	$560 M	$64 M	$260 M	$884 M	$1,700 M

III. COST ESTIMATE FORMAT

For the purposes of this study, a standardized, two-page, concept level, cost estimate format was developed to provide a uniform method of comparing costs across the variety of alternatives. The two-page format is loosely based on the Caltrans Project Study Report (PSR) cost estimate format, but is simplified and streamlined to fit the concept level analysis of this study. A separate cost estimate form was completed for each of the 13 alternatives. These cost estimates are attached in the Appendix.

The two-page cost estimate format consists of a heading section and a detail section. The heading section identifies the alternative, briefly describes the proposed improvements, and summarizes the cost estimate for three primary categories: (1) Construction cost; (2) Right of Way cost; and (3) Engineering Support cost. The detail section provides a breakdown of how the three primary categories were calculated.

The Construction cost detail is further divided into 4 subcategories: (a) roadway work; (b) structure work; (c) miscellaneous items; and (d) other additions. Roadway work includes the cost of actual infrastructure improvements on the ground and the associated work to construct them. Structure work includes the cost of the larger, typically concrete, structures. The "miscellaneous items" category includes the cost of specialty work and costs that are associated with construction but are not actual infrastructure improvements. The "other additions" category includes the cost of mobilization of construction equipment to a project and a contingency factor to account for the preliminary, concept level nature of these estimates.

Within each of the categories, a set of representative cost items was developed that could be quantified for each alternative. These representative cost items are used consistently across each of the alternatives so that cost estimates for different alternatives can be easily compared to each other. An appropriate unit of measure and unit cost was developed for each cost item. The observed recent price increases in steel, concrete and asphalt costs were considered in this effort and accounted for by addressing each major construction item separately and adding a small unit price contingency for each. The metric system was used for unit costs and for calculating quantities to conform to current Caltrans standards. The individual cost items are described in the following section.

IV. DESCRIPTION OF COST ITEMS

The cost items and unit costs used in this analysis are summarized in this section. The following abbreviations are used.

M = Meter (1 M = 3.3 feet)
M2 = Square meter (1 M2 = 11 square feet)
M3 = Cubic meter (1 M3 = 35 cubic feet)
KM = Kilometer (1 KM = 0.6 miles)
EA = Each
LS = Lump sum
R/W = Right of way
PS&E = Plans, specifications & estimate

CONSTRUCTION COST ITEMS

Roadway Work	**Unit Cost**
Site Preparation: This item includes clearing and grubbing and removal of existing improvements within a project boundary, except buildings, and is calculated based on the total project footprint area of the alternative. The unit cost was derived from averaging recent, local freeway construction project site preparation costs over their total project boundary areas.	$20 per M2 of project footprint area
Building Demolition: This item includes costs of demolishing residential or commercial buildings being impacted by the proposed alternative. An individual lump sum amount was estimated for each alternative based on evaluation of aerial photos overlaid on the proposed project footprint.	Lump Sum, unique for each project
Earthwork: This item includes both roadway excavation work and imported borrow required to complete the project. Structural excavation for depressed structures, U-channel structures, and cut and cover tunnels is also included in this item. The unit cost per cubic meter was derived from bid estimates of recent, local freeway construction projects.	$50 per M3 of proposed earthwork
Pavement Section – Local Roadway & Freeway: Two conservative pavement structural sections were assumed, one that would be typical for a local street and one that would be typical for a freeway. The unit costs were then derived by combining costs for asphalt concrete, aggregate base, and aggregate sub base per square meter of pavement structural section.	Local Road - $60 per M2 of pavement Freeway - $80 per M2 of pavement
Storm drainage: This item includes all standard drainage work for an alternative and is calculated based on the total project footprint area of the alternative. The unit cost was derived from averaging recent, local freeway construction project drainage costs over their total project boundary areas.	$10 per M2 of project footprint area
Special storm drainage: This item accounts for additional storm drainage needs such as pump stations, storage reservoirs, etc., for alternatives that have depressed roadways, intersections or tunnels where water cannot be carried away by standard gravity systems. An individual lump sum amount was estimated for each alternative based on the magnitude of the special drainage needs.	Lump Sum, unique for each project

Concrete barrier: Concrete traffic barriers were assumed on both elevated and depressed roadways along the edges of shoulders and in the medians between the two directions of traffic flow. The unit cost per meter was derived from bid estimates of recent, local freeway construction projects.	$500 per M of proposed barrier length
Curb, gutter and sidewalk: This item includes the cost of constructing sidewalks and street curbs & gutters and is calculated based on the actual area of proposed sidewalk improvements. The unit cost was derived by combining costs for both concrete and aggregate base work per square meter of curb, gutter and sidewalk from recent, local street improvement projects.	$120 per M2 of proposed gutter and sidewalk area
Landscaping and irrigation: This item includes all landscaping and irrigation costs for an alternative and is calculated based on the estimated area of required landscaping. The unit cost was derived from averaging recent, local freeway construction project landscaping and irrigation costs over the respective areas of actual landscaping placed.	$50 per M2 of proposed landscaped area
Signalized intersection: This item includes all associated costs of installing a new traffic signal on a project. Three separate unit costs were calculated based on experience with recent infrastructure projects to allow for more accurate allocation of cost based on size and complexity of a proposed traffic signal.	$100,000 for a small, simple signal $200,000 for a median size signal $300,000 for a large, complex signal
Lighting: This item includes all street lighting and electrical work for an alternative and is calculated based on the total project footprint area of the alternative. The unit cost was derived from averaging recent, local freeway construction project lighting and electrical costs over their total project boundary areas.	$10 per M2 of project footprint area
Minor items: This item accounts for a variety of small, miscellaneous and minor items of work that aren't feasible to itemize separately for a concept level cost estimate, such as guard rails, fencing, striping, signs, etc. This cost is assumed as 20 percent of the combined total cost of all the other roadway work items for a particular alternative.	20% of total roadway work costs

Structure Work	**Unit Cost**
Elevated structure: This item includes the costs of constructing an elevated roadway structure such as bridge crossings, flyover connector ramps, and elevated express lanes and is calculated based on the total plan area of the proposed structure. The unit cost for elevated structures was calculated for three different heights (or complexity) of structure to account for the increased cost of constructing taller or more complex structures: 1-story, 2-story, and complex. The unit cost includes all work associated with constructing the structure such as concrete, steel, forms, false work, columns, foundations & footings, abutments, approach slabs, structural excavation, etc.	$1,500 per M2 for 1-story structure $1,800 per M2 for 2-story structure $2,000 per M2 for complex structures
Excavation shoring, foundation slab, and finish wall: These three items are required to construct a depressed roadway or intersection and are only included on those particular alternatives that include this type of work – the Bayfront Expressway Grade Separations, Willow Road, and University Avenue alternatives (Alts. 3, 7 & 9).	
The excavation shoring item includes the cost of installing a concrete cast in drilled hole shoring system and is calculated based on the total exposed vertical wall area of the excavated trench or basin. The unit cost was derived from recent Bay area project installations of this type of shoring system. This item is also used in conjunction with the Depressed U-channel w/ Cantilever item and the Cut & Cover Box Culvert Tunnel item.	$1,200 per M2 of exposed, vertical wall
The foundation slab item includes the cost of all work associated with placing a concrete "seal course" and a concrete foundation slab for the depressed roadway or intersection and is calculated based on the actual volume of the proposed concrete foundation slab. The unit cost was derived from the cost to complete general structural concrete work in recent, local freeway construction projects.	$600 per M3 of foundation slab
The finish wall item includes the cost of constructing the final, structural concrete support wall in front of the excavation shoring system and is calculated based on the total exposed vertical wall area of the excavated trench or basin. The unit cost was derived from the cost to complete structural concrete retaining walls in recent, local freeway construction projects.	$600 per M2 of exposed, vertical wall

Depressed U-channel w/ cantilever: This item covers the cost of constructing a U-shaped, depressed, concrete structure to contain a depressed roadway with cantilevered "platforms" above on each side for local frontage roads and is calculated based on the actual concrete volume of the proposed structure. The unit cost was derived from the cost for complex structural concrete work on recent, local infrastructure projects and includes all work associated with constructing the structure such as concrete, steel reinforcement, forms, falsework, and a seal course below the U-channel.	$1,100 per M3 of structural concrete
Retaining wall: This item includes the cost of constructing above-grade retaining walls of various types and is calculated based on the proposed vertical wall area. The unit cost per square meter was derived from bid estimates for retaining wall work on recent, local freeway construction projects.	$1,200 per M2 of vertical wall area
Soundwall: This item includes the cost of constructing soundwalls at grade or on elevated roadway structures adjacent to residential areas and is calculated based on the proposed vertical soundwall area. The unit cost per square meter was derived from bid estimates for soundwall work on recent, local freeway construction projects. Soundwalls were assumed to be 4.0 meters high on grade and 1.8 meters high on elevated structures.	$400 per M2 of vertical soundwall area
Tunnel – cut and cover box culvert: This item includes the cost of constructing a reinforced concrete box culvert tunnel structure in an excavated trench and is calculated based on the actual concrete volume of the proposed box structure. The unit cost was derived from the cost for complex structural concrete work on recent, local infrastructure projects and includes all work associated with constructing the box culvert such as concrete, steel reinforcement, forms, falsework, and a seal course below the box. Excavation, shoring and earthwork to fill back over the box are not included in this item but in the items previously discussed.	$1,100 per M3 of structural concrete
Tunnel – single bored tube: This item includes the cost of constructing a mechanically bored tunnel structure for a 2-lane roadway and is calculated based on the plan footprint area of the proposed tunnel structure. The unit cost was derived from recent Caltrans cost estimates for major tunneling projects including the Devil's Slide Tunnel project in San Mateo County and the Coronado Tunnel project in San Diego.	$1,500 per M2 of tunnel plan footprint area

Overhead signs: The unit cost for proposed overhead sign structures was derived from averaging the costs of overhead signs on recent, local freeway construction projects.	$40,000 for each sign
Miscellaneous Items	**Unit Cost**
Traffic control/traffic handling: This item includes the costs of providing construction staging, detours and traffic control during construction. An individual lump sum amount was estimated for each alternative based on the construction complexity of that alternative and the degree of traffic impacts expected. Costs were derived from experience with similar recent construction projects. The exceptions to this method are the two Route 101 elevated express lane alternatives (Alts. 2.1 & 2.2) in which a unit cost per kilometer was used.	Lump Sum, unique for each project $2,000,000 per KM for 101 elevated express lanes
Water Pollution/Erosion Control: This item includes all permanent erosion control features for an alternative and all water pollution control work during construction, and is calculated based on the total project footprint area of the alternative. The unit cost was derived from averaging recent, local freeway construction project water pollution and erosion control costs over their total project boundary areas.	$5 per M2 of project footprint area
Temporary Widening: This item is used specifically for the two Route 101 elevated express lane alternatives (Alts. 2.1 & 2.2) due to the complex nature of temporarily shifting the freeway traffic out to allow for construction of the elevated structure in the median, and is calculated based on the plan area of actual temporary widening required (an 8 meter wide construction zone is needed in the median of the freeway to construct the structure). The unit cost includes all work associated with the temporary widening including excavation, temporary pavement section, drainage relocations, frontage road relocations, and other miscellaneous work.	$200 per M2 of freeway widening required
Tunnel ventilation & lighting: These items are used specifically for the Willow Road and University Avenue tunnel alternatives (Alts. 7.3 & 9.3) due to the special requirements of an enclosed traffic route and are calculated based on the plan footprint area of the proposed tunnel structure. The unit costs were derived from recent Caltrans cost estimates for major tunneling projects including the Devil's Slide Tunnel project in San Mateo County and the Coronado Tunnel project in San Diego.	$1,200 per M2 of plan tunnel area - Ventilation $300 per M2 of plan tunnel area – Lighting

Dewatering: This item includes the costs of dewatering excavated pits, trenches, foundations or drilled holes during construction. An individual lump sum or cost per meter amount was estimated for each alternative based on the specific dewatering requirements of that alternative. Costs were derived from experience with similar recent construction projects.	Lump Sum, unique for each project, or $2,500 per M of linear excavation
Railroad shoefly: This item is used specifically for the alternatives where a depressed roadway section will pass under the Dumbarton Rail Corridor railroad tracks. A temporary railroad "shoefly" detour track would have to be constructed around the crossing location until a new railroad bridge was constructed over the depressed roadway.	Lump Sum, $2,000,000 per shoefly

Other Additions	**Unit Cost**
Mobilization & contingency: This item includes the costs for construction mobilization and project contingency. This cost is assumed as 40 percent of the combined total cost of roadway work, structure work and miscellaneous items for a particular alternative.	40% of total construction costs

RIGHT OF WAY COST ITEMS

Acquisition: This item includes the costs of right of way acquisition and is calculated based on the estimated area of right of way take required to complete the project. It includes the cost for purchasing the land and relocating residents or businesses. Areas of required right of way acquisition were conservatively estimated based on the footprint of the proposed improvements overlaid on aerial photography of the project site. The unit cost per square meter was derived from discussions with local right of way agents working for public agencies.	$1,000 per M2 of right of way take
Utility Relocation: This item includes the cost to relocate existing utilities or install new utilities due to a project's impact. An individual lump sum amount was estimated for each alternative based on the degree of utility impacts expected. Costs were derived from experience with similar recent construction projects.	Lump Sum, unique for each project
Environmental Mitigation: This item includes the cost to create or buy new environmental habitat to mitigate for the loss of existing habitat due to a project's impact. An individual lump sum amount was estimated for each alternative based on the degree of environmental impacts expected. Costs were derived from experience with similar recent construction projects.	Lump Sum, unique for each project

ENGINEERING SUPPORT COST ITEMS

Environmental Documents: This item includes the costs for completing a Project Study Report, Project Report, and the associated environmental studies for a proposed project. This cost is assumed as 15 percent of the total construction cost for a particular alternative.	15% of construction cost
PS&E: This item includes the costs for engineering design and development of the plans, specifications and cost estimates for a proposed project. This cost is assumed as 15 percent of the total construction cost for a particular alternative.	15% of construction cost
R/W Engineering: This item includes the costs for right of way engineering, appraisals, right of way negotiations, and completion of final right of way documents for a proposed project. This cost is assumed as 10 percent of the total right of way costs for a particular alternative.	10% of right of way costs
Construction Management: This item includes the costs for administrating and managing the construction contract for a proposed project. This cost is assumed as 15 percent of the total construction cost for a particular alternative.	15% of construction cost
*Note: reduced percentages are used for support costs on the Route 101 elevated express lane alternatives due to the large scale and the singular, repetitive nature of the project	

V. CALCULATION OF QUANTITIES

Quantities were calculated for each individual project alternative based on the exhibits developed during the Alternatives Analysis phase of this study. CADD software was used to calculate areas or lengths of project elements directly from the exhibits. Earthwork and structure volumes were calculated by hand. Project area footprints were superimposed over aerial photography to estimate right of way takes, environmental impacts, and building impacts.

The Appendix contains individual two-page Cost Estimate Forms for each of the 13 project alternatives studied.

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Appendix - Cost Estimate Worksheets

KEY TO ABBREVIATIONS:

M = Meter (1 M = 3.3 feet)
M2 = Square meter (1 M2 = 11 square feet)
M3 = Cubic meter (1 M3 = 35 cubic feet)
KM = Kilometer (1 KM = 0.6 miles)
EA = Each
LS = Lump sum
R/W = Right of way
PS&E = Plans, specifications & estimate

February 27, 2006

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

Alternative: 1.1 - Route 101 Auxiliary Lanes - Embarcadero to Shoreline

Proposed Improvements: New auxiliary lane in each direction, San Antonio Rd interchange improvements, ramp modifications, drainage improvements, soundwalls, retaining walls, local street improvements

1)	Construction	$57,000,000	
2)	Right of Way	$20,000,000	
3)	Engineering Support	$28,000,000	
	Total Cost:	**$105,000,000**	**Year 2006**
	(Escalated at 3.5% per year)	$202,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	262,000	$5,240,000
Building Demolition	LS	$2,000,000	1	$2,000,000
Earthwork	M3	$50	9,400	$470,000
Pavement Section - Local Road	M2	$60	4,200	$252,000
Pavement Section - Freeway	M2	$80	69,000	$5,520,000
Storm Drainage	M2	$10	262,000	$2,620,000
Special Storm Drainage (Longitud. Box)	LS	$4,000,000	1	$4,000,000
Concrete Barrier	M	$500	600	$300,000
Curb, Gutter and Sidewalk	M2	$120	1,200	$144,000
Landscaping and Irrigation	M2	$50	67,000	$3,350,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	1	$200,000
Signalized Intersection - Large	EA	$300,000	0	-
Lighting	M2	$10	67,000	$670,000
Minor Items (20% of Roadway)	LS	$4,953,000	1	$4,953,000
			Subtotal	$29,700,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	1,700	$2,550,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Depressed U-Channel	M3	$1,100	0	-
Retaining Wall	M2	$1,200	300	$360,000
Soundwall	M2	$400	2,500	$1,000,000
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	16	$640,000
			Subtotal	$4,550,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$5,000,000	1	$5,000,000
Water Pollution/Erosion Control	M2	$5	262,000	$1,310,000
			Subtotal	$6,310,000
Other Additions				
Mobilization & Contingency (40%)	LS	$16,224,000	1	$16,200,000
			Total Construction Cost:	**$56,760,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	5,000	$5,000,000
Utility Relocation	LS	$10,000,000	1	$10,000,000
Environmental Mitigation	LS	$5,000,000	1	$5,000,000
			Total Right of Way Cost:	**$20,000,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$8,510,000	1	$8,510,000
PS&E (15%)	LS	$8,510,000	1	$8,510,000
R/W Engineering (10% of R/W Cost)	LS	$2,000,000	1	$2,000,000
Construction Management (15%)	LS	$8,510,000	1	$8,510,000
			Total Engineering Support Cost:	**$27,500,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

Alternative: 2.1 - Route 101 Elevated Express Lanes (Mixed Traffic)

Proposed Improvements: Elevated express lanes down freeway median, utility relocations, new and relocated sound walls, frontage road relocations

1)	Construction	$900,000,000	
2)	Right of Way	$80,000,000	
3)	Engineering Support	$230,000,000	
	Total Cost:	**$1,210,000,000**	**Year 2006**
	(Escalated at 3.5% per year)	$2,330,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	705,000	$14,100,000
Building Demolition	LS	$5,000,000	1	$5,000,000
Earthwork	M3	$50	73,000	$3,650,000
Pavement Section - Local Road	M2	$60	40,000	$2,400,000
Pavement Section - Freeway	M2	$80	64,000	$5,120,000
Storm Drainage	M2	$10	705,000	$7,050,000
Special Storm Drainage	LS	$4,000,000	1	$4,000,000
Concrete Barrier	M	$500	46,000	$23,000,000
Curb, Gutter and Sidewalk	M2	$120	10,000	$1,200,000
Landscaping and Irrigation	M2	$50	10,000	$500,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	0	-
Lighting	M2	$10	8,400	$84,000
Minor Items (20% of Roadway)	LS	$13,221,000	1	$13,221,000
			Subtotal	$79,300,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	0	-
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	239,000	$478,000,000
Depressed U-Channel	M3	$1,100	0	-
Retaining Wall	M2	$1,200	3,100	$3,720,000
Soundwall	M2	$400	80,000	$32,000,000
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	40	$1,600,000
			Subtotal	$515,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	KM	$2,000,000	15	$30,000,000
Water Pollution/Erosion Control	M2	$5	705,000	$3,525,000
Temporary Widening	M2	$200	60,000	$12,000,000
Dewatering	LS	$5,000,000	1	$5,000,000
			Subtotal	$50,500,000
Other Additions				
Mobilization & Contingency (40%)	LS	$257,920,000	1	$258,000,000
			Total Construction Cost:	**$902,800,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	30,000	$30,000,000
Utility Relocation	LS	$40,000,000	1	$40,000,000
Environmental Mitigation	LS	$10,000,000	1	$10,000,000
			Total Right of Way Cost:	**$80,000,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (5%)	LS	$45,140,000	1	$45,140,000
PS&E (10%)	LS	$90,280,000	1	$90,280,000
R/W Engineering (10% of R/W Cost)	LS	$8,000,000	1	$8,000,000
Construction Management (10%)	LS	$90,280,000	1	$90,280,000
			Total Engineering Support Cost:	**$234,000,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

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February 23, 2006

Alternative: 2.2 - Route 101 Elevated Express Lanes (HOV only)

Proposed Improvements: Elevated express lanes down freeway median, utility relocations, new and relocated sound walls, frontage road relocations

1)	Construction	$850,000,000	
2)	Right of Way	$70,000,000	
3)	Engineering Support	$220,000,000	
	Total Cost:	**$1,140,000,000**	**Year 2006**
	(Escalated at 3.5% per year)	$2,190,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	721,000	$14,420,000
Building Demolition	LS	$5,000,000	1	$5,000,000
Earthwork	M3	$50	59,000	$2,950,000
Pavement Section - Local Road	M2	$60	40,000	$2,400,000
Pavement Section - Freeway	M2	$80	59,000	$4,720,000
Storm Drainage	M2	$10	721,000	$7,210,000
Special Storm Drainage	LS	$2,000,000	1	$2,000,000
Concrete Barrier	M	$500	45,000	$22,500,000
Curb, Gutter and Sidewalk	M2	$120	10,000	$1,200,000
Landscaping and Irrigation	M2	$50	10,000	$500,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	0	-
Lighting	M2	$10	6,000	$60,000
Minor Items (20% of Roadway)	LS	$12,592,000	1	$12,592,000
			Subtotal	$75,600,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	0	-
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	224,200	$448,400,000
Depressed U-Channel	M3	$1,100	0	-
Retaining Wall	M2	$1,200	2,500	$3,000,000
Soundwall	M2	$400	77,200	$30,880,000
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	40	$1,600,000
			Subtotal	$484,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	KM	$2,000,000	15	$30,000,000
Water Pollution/Erosion Control	M2	$5	705,000	$3,525,000
Temporary Widening	M2	$200	60,000	$12,000,000
Dewatering	LS	$5,000,000	1	$5,000,000
			Subtotal	$50,500,000
Other Additions				
Mobilization & Contingency (40%)	LS	$244,040,000	1	$244,000,000
			Total Construction Cost:	**$854,100,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	20,000	$20,000,000
Utility Relocation	LS	$40,000,000	1	$40,000,000
Environmental Mitigation	LS	$10,000,000	1	$10,000,000
			Total Right of Way Cost:	**$70,000,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (5%)	LS	$42,710,000	1	$42,710,000
PS&E (10%)	LS	$85,410,000	1	$85,410,000
R/W Engineering (10% of R/W Cost)	LS	$7,000,000	1	$7,000,000
Construction Management (10%)	LS	$85,410,000	1	$85,410,000
			Total Engineering Support Cost:	**$221,000,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

Alternative: 3.1 - Bayfront Expressway Grade Separations

Proposed Improvements: Grade separations at University Avenue and Willow Road intersections, depressed local street intersections, fly-over ramps, retaining walls

1)	Construction	$180,000,000	
2)	Right of Way	$67,000,000	
3)	Engineering Support	$86,000,000	
	Total Cost:	**$333,000,000**	**Year 2006**
	(Escalated at 3.5% per year)	$640,000,000	Year 2025

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1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	75,000	$1,500,000
Building Demolition	LS	$0	0	-
Earthwork	M3	$50	87,000	$4,350,000
Pavement Section - Local Road	M2	$60	28,000	$1,680,000
Pavement Section - Freeway	M2	$80	30,000	$2,400,000
Storm Drainage	M2	$10	75,000	$750,000
Special Storm Drainage (Pumps)	EA	$4,000,000	2	$8,000,000
Concrete Barrier	M	$500	2,300	$1,150,000
Curb, Gutter and Sidewalk	M2	$120	2,600	$312,000
Landscaping and Irrigation	M2	$50	75,000	$3,750,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	2	$400,000
Signalized Intersection - Large	EA	$300,000	0	-
Lighting	M2	$10	75,000	$750,000
Minor Items (20% of Roadway)	LS	$5,008,000	1	$5,008,000
			Subtotal	$30,100,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	16,000	$24,000,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Excavation Shoring	M2	$1,200	14,000	$16,800,000
Foundation Slab	M3	$600	42,000	$25,200,000
Finish Wall	M2	$600	14,000	$8,400,000
Retaining Wall	M2	$1,200	3,000	$3,600,000
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	5	$200,000
			Subtotal	$78,200,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$15,000,000	1	$15,000,000
Water Pollution/Erosion Control	M2	$5	75,000	$375,000
Dewatering	EA	$1,000,000	2	$2,000,000
			Subtotal	$17,400,000
Other Additions				
Mobilization & Contingency (40%)	LS	$50,280,000	1	$50,300,000
			Total Construction Cost:	**$176,000,000**
2) RIGHT OF WAY				
Acquisition	M2	$1,000	42,000	$42,000,000
Utility Relocation	LS	$10,000,000	1	$10,000,000
Environmental Mitigation	LS	$15,000,000	1	$15,000,000
			Total Right of Way Cost:	**$67,000,000**
3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)				
Environmental Documents (15%)	LS	$26,400,000	1	$26,400,000
PS&E (15%)	LS	$26,400,000	1	$26,400,000
R/W Engineering (10% of R/W Cost)	LS	$6,700,000	1	$6,700,000
Construction Management (15%)	LS	$26,400,000	1	$26,400,000
			Total Engineering Support Cost:	**$85,900,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Kimley-Horn and Associates, Inc.

February 27, 2006

Alternative: 4.1 - Willow Road Short Term Improvements

Proposed Improvements: Signal modification and minor approach widening at Ivy/Willow. Signal timing at four intersections.

1)	Construction	$92,000	
2)	Right of Way	-	
3)	Engineering Support	$30,000	
	Total Cost:	**$122,000**	**Year 2006**
	(Escalated at 3.5% per year)	$235,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	150	$3,000
Building Demolition	LS	$0	0	-
Earthwork	M3	$50	0	-
Pavement Section - Local Road	M2	$60	90	$5,400
Pavement Section - Freeway	M2	$80	0	-
Storm Drainage	M2	$10	30	$300
Special Storm Drainage	LS	$0	0	-
Concrete Barrier	M	$500	0	-
Curb, Gutter and Sidewalk	M2	$120	60	$7,200
Landscaping and Irrigation	M2	$50	0	-
Signalized Intersection Modification	EA	$25,000	1	$25,000
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	0	-
Lighting	M2	$10	0	-
Minor Items (20% of Roadway)	LS	$8,000	1	$8,000
			Subtotal	$48,900

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Kimley-Horn and Associates, Inc.

February 27, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	0	-
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Depressed U-Channel	M3	$1,100	0	-
Retaining Wall	M2	$1,200	0	-
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	0	-
			Subtotal	$0
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$8,000	1	$8,000
Traffic Signal Timing	EA	$1,500	6	$9,000
Water Pollution/Erosion Control	M2	$5	0	-
			Subtotal	$17,000
Other Additions				
Mobilization & Contingency (40%)	LS	$26,000	1	$26,000
			Total Construction Cost:	**$91,900**

2) RIGHT OF WAY

Acquisition	M2	$1,000	0	-
Utility Relocation	LS	$0	1	-
Environmental Mitigation	LS	$0	1	-
			Total Right of Way Cost:	**$0**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$10,000	1	$10,000
PS&E (15%)	LS	$10,000	1	$10,000
R/W Engineering (10% of R/W Cost)	LS	$0	1	-
Construction Management (15%)	LS	$10,000	1	$10,000
			Total Engineering Support Cost:	**$30,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

Alternative: 6.1 - Willow Road Elevated Viaduct

Proposed Improvements: Elevated Viaduct Structure, Fly-over connecting ramps, local street improvements, utility relocation, engineering support

1)	Construction	$96,000,000	
2)	Right of Way	$33,000,000	
3)	Engineering Support	$46,000,000	
	Total Cost:	**$175,000,000**	**Year 2006**
	(Escalated to 3.5% per year)	$336,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	55,000	$1,100,000
Building Demolition	LS	$0	1	-
Earthwork	M3	$50	2,000	$100,000
Pavement Section - Local Road	M2	$60	0	-
Pavement Section - Freeway	M2	$80	10,000	$800,000
Storm Drainage	M2	$10	55,000	$550,000
Special Storm Drainage (Pumps)	LS	$0	1	-
Concrete Barrier	M	$500	7,000	$3,500,000
Curb, Gutter and Sidewalk	M2	$120	0	-
Landscaping and Irrigation	M2	$50	3,400	$170,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	3	$900,000
Lighting	M2	$10	55,000	$550,000
Minor Items (20% of Roadway)	LS	$1,534,000	1	$1,534,000
			Subtotal	$9,200,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	29,000	$43,500,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Excavation Shoring	M2	$1,200	0	-
Depressed U-Channel w/ Cantilever	M3	$1,100	0	-
Retaining Wall	M2	$1,200	2,000	$2,400,000
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$46,100,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$11,000,000	1	$11,000,000
Water Pollution/Erosion Control	M2	$5	55,000	$275,000
Tunnel Ventilation	M2	$1,200	0	-
Tunnel Lighting	M2	$300	0	-
Dewatering	M	$2,500	0	-
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$13,300,000
Other Additions				
Mobilization & Contingency (40%)	LS	$27,440,000	1	$27,400,000
			Total Construction Cost:	**$96,000,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	5,400	$5,400,000
Utility Relocation	LS	$22,000,000	1	$22,000,000
Environmental Mitigation	LS	$5,000,000	1	$5,000,000
			Total Right of Way Cost:	**$32,400,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$14,400,000	1	$14,400,000
PS&E (15%)	LS	$14,400,000	1	$14,400,000
R/W Engineering (10% of R/W Cost)	LS	$3,240,000	1	$3,240,000
Construction Management (15%)	LS	$14,400,000	1	$14,400,000
			Total Engineering Support Cost:	**$46,400,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

Alternative: 7.1 - Willow Road Depressed Express Lanes

Proposed Improvements: Depressed roadway, bored portal approach tunnels, local street overcrossings, local access frontage roads, utility relocations, street lighting

1)	Construction	$170,000,000	
2)	Right of Way	$40,000,000	
3)	Engineering Support	$82,000,000	
	Total Cost:	**$292,000,000**	**Year 2006**
	(Escalated at 3.5% per year)	$561,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity		Item Cost
Roadway Work					
Site Preparation	M2	$20	55,000		$1,100,000
Building Demolition	LS	$0	1	-	
Earthwork	M3	$50	325,000		$16,250,000
Pavement Section - Local Road	M2	$60	20,000		$1,200,000
Pavement Section - Freeway	M2	$80	9,300		$744,000
Storm Drainage	M2	$10	55,000		$550,000
Special Storm Drainage (Pumps)	LS	$10,000,000	1		$10,000,000
Concrete Barrier	M	$500	7,000		$3,500,000
Curb, Gutter and Sidewalk	M2	$120	9,000		$1,080,000
Landscaping and Irrigation	M2	$50	3,400		$170,000
Signalized Intersection - Small	EA	$100,000	0	-	
Signalized Intersection - Medium	EA	$200,000	0	-	
Signalized Intersection - Large	EA	$300,000	3		$900,000
Lighting	M2	$10	55,000		$550,000
Minor Items (20% of Roadway)	LS	$7,209,000	1		$7,209,000
			Subtotal		$43,300,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	1,500	$2,250,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Excavation Shoring	M2	$1,200	12,000	$14,400,000
Foundation Slab	M3	$600	22,000	$13,200,000
Finish Wall	M2	$600	12,000	$7,200,000
Retaining Wall	M2	$1,200	2,000	$2,400,000
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	16,400	$24,600,000
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$64,200,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$11,000,000	1	$11,000,000
Water Pollution/Erosion Control	M2	$5	55,000	$275,000
Dewatering	M	$2,500	1,100	$2,750,000
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$16,000,000
Other Additions				
Mobilization & Contingency (40%)	LS	$49,400,000	1	$49,400,000
			Total Construction Cost:	**$172,900,000**
2) RIGHT OF WAY				
Acquisition	M2	$1,000	12,600	$12,600,000
Utility Relocation	LS	$22,000,000	1	$22,000,000
Environmental Mitigation	LS	$5,000,000	1	$5,000,000
			Total Right of Way Cost:	**$39,600,000**
3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)				
Environmental Documents (15%)	LS	$25,940,000	1	$25,940,000
PS&E (15%)	LS	$25,940,000	1	$25,940,000
R/W Engineering (10% of R/W Cost)	LS	$3,960,000	1	$3,960,000
Construction Management (15%)	LS	$25,940,000	1	$25,940,000
			Total Engineering Support Cost:	**$81,800,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

Alternative: 7.2 - Willow Road Depressed Express Lanes w/ Cantilever Frontage Roads

Proposed Improvements: Depressed roadway with cantilever local access frontage roads, bored portal approach tunnels, local street overcrossings, utility relocations, street lighting

1)	Construction	$230,000,000	
2)	Right of Way	$33,000,000	
3)	Engineering Support	$110,000,000	
	Total Cost:	**$373,000,000**	**Year 2006**
	(Escalated to 3.5% per year)	$717,000,000	Year 2025

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1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	55,000	$1,100,000
Building Demolition	LS	$0	1	-
Earthwork	M3	$50	324,000	$16,200,000
Pavement Section - Local Road	M2	$60	7,500	$450,000
Pavement Section - Freeway	M2	$80	9,300	$744,000
Storm Drainage	M2	$10	55,000	$550,000
Special Storm Drainage (Pumps)	LS	$10,000,000	1	$10,000,000
Concrete Barrier	M	$500	7,000	$3,500,000
Curb, Gutter and Sidewalk	M2	$120	9,000	$1,080,000
Landscaping and Irrigation	M2	$50	3,400	$170,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	3	$900,000
Lighting	M2	$10	55,000	$550,000
Minor Items (20% of Roadway)	LS	$7,049,000	1	$7,049,000
			Subtotal	$42,300,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	1,500	$2,250,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Excavation Shoring	M2	$1,200	12,000	$14,400,000
Depressed U-Channel w/ Cantilever	M3	$1,100	57,000	$62,700,000
Retaining Wall	M2	$1,200	2,000	$2,400,000
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	16,400	$24,600,000
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$107,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$11,000,000	1	$11,000,000
Water Pollution/Erosion Control	M2	$5	55,000	$275,000
Dewatering	M	$2,500	1,100	$2,750,000
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$16,000,000
Other Additions				
Mobilization & Contingency (40%)	LS	$66,120,000	1	$66,100,000
			Total Construction Cost:	**$231,400,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	5,400	$5,400,000
Utility Relocation	LS	$22,000,000	1	$22,000,000
Environmental Mitigation	LS	$5,000,000	1	$5,000,000
			Total Right of Way Cost:	**$32,400,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$34,710,000	1	$34,710,000
PS&E (15%)	LS	$34,710,000	1	$34,710,000
R/W Engineering (10% of R/W Cost)	LS	$3,240,000	1	$3,240,000
Construction Management (15%)	LS	$34,710,000	1	$34,710,000
			Total Engineering Support Cost:	**$107,000,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

Alternative: 7.3 - Willow Road Tunnel

Proposed Improvements: Cut and cover tunnel, bored portal approach tunnels, local street reconstructed, utility relocations, street lighting

1)	Construction	$280,000,000	
2)	Right of Way	$33,000,000	
3)	Engineering Support	$130,000,000	
	Total Cost:	**$443,000,000**	**Year 2006**
	(Escalated to 3.5% per year)	$852,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	55,000	$1,100,000
Building Demolition	LS	$0	1	-
Earthwork	M3	$50	324,000	$16,200,000
Pavement Section - Local Road	M2	$60	35,000	$2,100,000
Pavement Section - Freeway	M2	$80	9,000	$720,000
Storm Drainage	M2	$10	55,000	$550,000
Special Storm Drainage (Pumps)	LS	$5,000,000	1	$5,000,000
Concrete Barrier	M	$500	7,000	$3,500,000
Curb, Gutter and Sidewalk	M2	$120	3,500	$420,000
Landscaping and Irrigation	M2	$50	3,400	$170,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	3	$900,000
Lighting	M2	$10	55,000	$550,000
Minor Items (20% of Roadway)	LS	$6,242,000	1	$6,242,000
			Subtotal	$37,500,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Caltrans

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	0	-
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Excavation Shoring	M2	$1,200	15,000	$18,000,000
Depressed U-Channel w/ Cantilever	M3	$1,100	0	-
Retaining Wall	M2	$1,200	2,000	$2,400,000
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	72,000	$79,200,000
Tunnel - Single Bored Tube	M2	$1,500	16,400	$24,600,000
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$124,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$11,000,000	1	$11,000,000
Water Pollution/Erosion Control	M2	$5	55,000	$275,000
Tunnel Ventilation	M2	$1,200	17,000	$20,400,000
Tunnel Lighting	M2	$300	17,000	$5,100,000
Dewatering	M	$2,500	1,100	$2,750,000
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$41,500,000
Other Additions				
Mobilization & Contingency (40%)	LS	$81,200,000	1	$81,200,000
			Total Construction Cost:	**$284,200,000**
2) RIGHT OF WAY				
Acquisition	M2	$1,000	5,400	$5,400,000
Utility Relocation	LS	$22,000,000	1	$22,000,000
Environmental Mitigation	LS	$5,000,000	1	$5,000,000
			Total Right of Way Cost:	**$32,400,000**
3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)				
Environmental Documents (15%)	LS	$42,630,000	1	$42,630,000
PS&E (15%)	LS	$42,630,000	1	$42,630,000
R/W Engineering (10% of R/W Cost)	LS	$3,240,000	1	$3,240,000
Construction Management (15%)	LS	$42,630,000	1	$42,630,000
			Total Engineering Support Cost:	**$131,000,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Kimley-Horn and Associates, Inc.

February 27, 2006

Alternative: 8.1 - University Avenue Short Term Improvements

Proposed Improvements: Signal modifications at four intersections. Signal timing at six intersections.

1)	Construction	$180,000	
2)	Right of Way	-	
3)	Engineering Support	$90,000	
	Total Cost:	**$270,000**	**Year 2006**
	(Escalated at 3.5% per year)	$519,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	0	-
Building Demolition	LS	$0	0	-
Earthwork	M3	$50	0	-
Pavement Section - Local Road	M2	$60	0	-
Pavement Section - Freeway	M2	$80	0	-
Storm Drainage	M2	$10	0	-
Special Storm Drainage	LS	$0	0	-
Concrete Barrier	M	$500	0	-
Curb, Gutter and Sidewalk	M2	$120	0	-
Landscaping and Irrigation	M2	$50	0	-
Signalized Intersection Modification	EA	$25,000	4	$100,000
Signalized Intersection - Medium	EA	$200,000	0	-
Signalized Intersection - Large	EA	$300,000	0	-
Lighting	M2	$10	0	-
Minor Items (20% of Roadway)	LS	$20,000	1	$20,000
			Subtotal	$120,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Kimley-Horn and Associates, Inc.

February 27, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	0	-
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	0	-
Depressed U-Channel	M3	$1,100	0	-
Retaining Wall	M2	$1,200	0	-
Soundwall	M2	$400	0	-
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	0	-
			Subtotal	$0
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$0	1	-
Traffic Signal Timing	EA	$1,500	6	$9,000
Water Pollution/Erosion Control	M2	$5	0	-
			Subtotal	$9,000
Other Additions				
Mobilization & Contingency (40%)	LS	$52,000	1	$52,000
			Total Construction Cost:	**$181,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	0	-
Utility Relocation	LS	$0	1	-
Environmental Mitigation	LS	$0	1	-
			Total Right of Way Cost:	**$0**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$30,000	1	$30,000
PS&E (15%)	LS	$30,000	1	$30,000
R/W Engineering (10% of R/W Cost)	LS	$0	1	-
Construction Management (15%)	LS	$30,000	1	$30,000
			Total Engineering Support Cost:	**$90,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

Alternative: 9.1 - University Avenue Depressed Express Lanes

Proposed Improvements: Depressed roadway, fly-over ramp connections, local street overcrossings, local access frontage roads, utility relocations, street lighting

1)	Construction	$310,000,000	
2)	Right of Way	$72,000,000	
3)	Engineering Support	$150,000,000	
	Total Cost:	**$532,000,000**	**Year 2006**
	(Escalated at 3.5% per year)	$1,023,000,000	Year 2025

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1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	113,000	$2,260,000
Building Demolition	LS	$4,000,000	1	$4,000,000
Earthwork	M3	$50	425,000	$21,250,000
Pavement Section - Local Road	M2	$60	49,000	$2,940,000
Pavement Section - Freeway	M2	$80	14,000	$1,120,000
Storm Drainage	M2	$10	113,000	$1,130,000
Special Storm Drainage (Pumps)	LS	$20,000,000	1	$20,000,000
Concrete Barrier	M	$500	17,000	$8,500,000
Curb, Gutter and Sidewalk	M2	$120	15,000	$1,800,000
Landscaping and Irrigation	M2	$50	2,000	$100,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	3	$600,000
Signalized Intersection - Large	EA	$300,000	1	$300,000
Lighting	M2	$10	113,000	$1,130,000
Minor Items (20% of Roadway)	LS	$13,026,000	1	$13,026,000
			Subtotal	$78,200,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	9,000	$13,500,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	9,000	$18,000,000
Excavation Shoring	M2	$1,200	26,000	$31,200,000
Foundation Slab	M3	$600	51,000	$30,600,000
Finish Wall	M2	$600	26,000	$15,600,000
Retaining Wall	M2	$1,200	2,400	$2,880,000
Soundwall	M2	$400	500	$200,000
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$112,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$20,000,000	1	$20,000,000
Water Pollution/Erosion Control	M2	$5	113,000	$565,000
Dewatering	M	$2,500	2,100	$5,250,000
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$27,800,000
Other Additions				
Mobilization & Contingency (40%)	LS	$87,200,000	1	$87,200,000
			Total Construction Cost:	**$305,200,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	22,000	$22,000,000
Utility Relocation	LS	$40,000,000	1	$40,000,000
Environmental Mitigation	LS	$10,000,000	1	$10,000,000
			Total Right of Way Cost:	**$72,000,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$45,780,000	1	$45,780,000
PS&E (15%)	LS	$45,780,000	1	$45,780,000
R/W Engineering (10% of R/W Cost)	LS	$7,200,000	1	$7,200,000
Construction Management (15%)	LS	$45,780,000	1	$45,780,000
			Total Engineering Support Cost:	**$145,000,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

Alternative: 9.2 - University Avenue Depressed Express Lanes w/ Cantilever Frontage Roads

Proposed Improvements: Depressed roadway with cantilever local access frontage roads, fly-over ramps, local street overcrossings, utility relocations, street lighting

1)	Construction	$440,000,000	
2)	Right of Way	$64,000,000	
3)	Engineering Support	$200,000,000	
	Total Cost:	**$704,000,000**	**Year 2006**
	(Escalated to 3.5% per year)	$1,350,000,000	Year 2025

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1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	113,000	$2,260,000
Building Demolition	LS	$2,000,000	1	$2,000,000
Earthwork	M3	$50	425,000	$21,250,000
Pavement Section - Local Road	M2	$60	18,000	$1,080,000
Pavement Section - Freeway	M2	$80	14,000	$1,120,000
Storm Drainage	M2	$10	113,000	$1,130,000
Special Storm Drainage (Pumps)	LS	$20,000,000	1	$20,000,000
Concrete Barrier	M	$500	17,000	$8,500,000
Curb, Gutter and Sidewalk	M2	$120	15,000	$1,800,000
Landscaping and Irrigation	M2	$50	2,000	$100,000
Signalized Intersection - Small	EA	$100,000	0	-
Signalized Intersection - Medium	EA	$200,000	3	$600,000
Signalized Intersection - Large	EA	$300,000	1	$300,000
Lighting	M2	$10	113,000	$1,130,000
Minor Items (20% of Roadway)	LS	$12,254,000	1	$12,254,000
			Subtotal	$73,500,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	9,000	$13,500,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	9,000	$18,000,000
Excavation Shoring	M2	$1,200	26,000	$31,200,000
Depressed U-Channel w/ Cantilever	M3	$1,100	131,000	$144,100,000
Retaining Wall	M2	$1,200	2,400	$2,880,000
Soundwall	M2	$400	500	$200,000
Tunnel - Cut & Cover Box Culvert	M3	$1,100	0	-
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$210,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$20,000,000	1	$20,000,000
Water Pollution/Erosion Control	M2	$5	113,000	$565,000
Dewatering	M	$2,500	2,100	$5,250,000
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$27,800,000
Other Additions				
Mobilization & Contingency (40%)	LS	$124,520,000	1	$125,000,000
			Total Construction Cost:	**$436,300,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	14,000	$14,000,000
Utility Relocation	LS	$40,000,000	1	$40,000,000
Environmental Mitigation	LS	$10,000,000	1	$10,000,000
			Total Right of Way Cost:	**$64,000,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$65,450,000	1	$65,450,000
PS&E (15%)	LS	$65,450,000	1	$65,450,000
R/W Engineering (10% of R/W Cost)	LS	$6,400,000	1	$6,400,000
Construction Management (15%)	LS	$65,450,000	1	$65,450,000
			Total Engineering Support Cost:	**$203,000,000**

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

Alternative: 9.3 - University Avenue Tunnel

Proposed Improvements: Cut and cover tunnel, fly-over ramp connections, local street reconstructed, utility relocations, street lighting

1)	Construction	$560,000,000	
2)	Right of Way	$64,000,000	
3)	Engineering Support	$260,000,000	
	Total Cost:	**$884,000,000**	**Year 2006**
	(Escalated to 3.5% per year)	$1,700,000,000	Year 2025

1) CONSTRUCTION

	Unit	Unit Price	Quantity	Item Cost
Roadway Work				
Site Preparation	M2	$20	103,000	$2,060,000
Building Demolition	LS	$1,000,000	1	$1,000,000
Earthwork	M3	$50	590,000	$29,500,000
Pavement Section - Local Road	M2	$60	77,000	$4,620,000
Pavement Section - Freeway	M2	$80	14,000	$1,120,000
Storm Drainage	M2	$10	103,000	$1,030,000
Special Storm Drainage (Pumps)	LS	$10,000,000	1	$10,000,000
Concrete Barrier	M	$500	13,000	$6,500,000
Curb, Gutter and Sidewalk	M2	$120	6,400	$768,000
Landscaping and Irrigation	M2	$50	6,300	$315,000
Signalized Intersection - Small	EA	$100,000	4	$400,000
Signalized Intersection - Medium	EA	$200,000	3	$600,000
Signalized Intersection - Large	EA	$300,000	1	$300,000
Lighting	M2	$10	103,000	$1,030,000
Minor Items (20% of Roadway)	LS	$11,849,000	1	$11,849,000
			Subtotal	$71,100,000

2020 PENINSULA GATEWAY STUDY
PRELIMINARY COST ESTIMATE SUMMARY

Mark Thomas & Company, Inc.

February 23, 2006

	Unit	Unit Price	Quantity	Item Cost
Structure Work				
Elevated Structure - 1 Story	M2	$1,500	4,000	$6,000,000
Elevated Structure - 2 Story	M2	$1,800	0	-
Elevated Structure - Complex	M2	$2,000	9,000	$18,000,000
Excavation Shoring	M2	$1,200	34,000	$40,800,000
Depressed U-Channel w/ Cantilever	M3	$1,100	0	-
Retaining Wall	M2	$1,200	2,400	$2,880,000
Soundwall	M2	$400	500	$200,000
Tunnel - Cut & Cover Box Culvert	M3	$1,100	168,000	$184,800,000
Tunnel - Single Bored Tube	M2	$1,500	0	-
Overhead Signs	EA	$40,000	4	$160,000
			Subtotal	$253,000,000
Miscellaneous Items				
Traffic Control/Traffic Handling	LS	$20,000,000	1	$20,000,000
Water Pollution/Erosion Control	M2	$5	103,000	$515,000
Tunnel Ventilation	M2	$1,200	32,000	$38,400,000
Tunnel Lighting	M2	$300	32,000	$9,600,000
Dewatering	M	$2,500	2,100	$5,250,000
Railroad Shoefly	LS	$2,000,000	1	$2,000,000
			Subtotal	$75,800,000
Other Additions				
Mobilization & Contingency (40%)	LS	$159,960,000	1	$160,000,000
			Total Construction Cost:	**$559,900,000**

2) RIGHT OF WAY

Acquisition	M2	$1,000	14,000	$14,000,000
Utility Relocation	LS	$40,000,000	1	$40,000,000
Environmental Mitigation	LS	$10,000,000	1	$10,000,000
			Total Right of Way Cost:	**$64,000,000**

3) ENGINEERING SUPPORT (Percentage of Total Construction Cost)

Environmental Documents (15%)	LS	$83,990,000	1	$83,990,000
PS&E (15%)	LS	$83,990,000	1	$83,990,000
R/W Engineering (10% of R/W Cost)	LS	$6,400,000	1	$6,400,000
Construction Management (15%)	LS	$83,990,000	1	$83,990,000
			Total Engineering Support Cost:	**$258,000,000**